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DESCRIPTION

TRANSFLECTIVE LIQUID CRYSTAL DISPLAY PANEL,
2D/3D SWITCHING TYPE LIQUID CRYSTAL DISPLAY
PANEL, AND
2D/3D SWITCHING TYPE LIQUID CRYSTAL DISPLAY

TECHNICAL FIELD

The present invention relates to a transflective liquid crystal display panel used as a displaying liquid crystal panel in a liquid crystal display panel capable of switching between a first display and a second display. The invention also relates to a 2D/3D switching type liquid crystal display panel incorporating the transflective liquid crystal display panel, and to a 2D/3D switching type liquid crystal display.

BACKGROUND ART

In a normal field of vision, the two eyes perceive views of the world from two different perspectives due to their spatial separation within the head. The images from these two perspectives are then recognized as a stereoscopic image by the brain due to parallax of the two images. By utilizing this principle, there has been developed a liquid crystal display in which 3D

As described with reference to Fig. 8 above, 3D display utilizes linearity of light emitted from the backlight and transmitted through the liquid crystal display panel. Therefore, in 3D display, only the transmissive region of each pixel is used, and the reflective region is not used at all. Also, when 2D display is performed, since the diffusing process for preventing *moire* is performed over the entire liquid crystal display panel, its effect also covers the transmissive region.

However, since the diffuser process gives the scattering effect to the light that emerges from the display surface side of the liquid crystal display panel, the display performance of 3D display utilizing linearity of light deteriorates significantly when the scattering effect is given to the outgoing light from the transmissive region of the liquid crystal display panel.

In other words, when the 2D/3D switching function and the transflective function are used in combination in the same liquid crystal display panel, desirable 3D display cannot be obtained while at the same time preventing *moire* in 2D display.

DISCLOSURE OF INVENTION

The present invention was made to solve the foregoing problem. An object of the present invention is to

provide a liquid crystal display panel including a function for switching between a first display and a second display and a transflective function, in which desirable second display (3D display) can be obtained while at the same time preventing *moire* in first display (2D display).

To attain the foregoing object, a transflective liquid crystal display panel of the present invention includes a reflective region for performing reflective display; and a transmissive region for performing transmissive display, the reflective region and the transmissive region being provided for each pixel, and a diffuser process being performed only in a portion corresponding to the reflective region.

The diffuser process utilizes the scattering effect of light to prevent *moire*, which is generated by microscopic irregular patterns formed on a surface of a reflective electrode. In other words, in a transmissive region where *moire* does not occur, there is no problem in performing display even if the scattering effect due to the diffuser process cannot be obtained.

On the other hand, when the transflective liquid crystal display panel is used as display image generating means in a 2D/3D switching type liquid crystal display panel, the transmissive region is used for performing both 2D display and 3D display. In 3D display, parallax is

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given to a right eye image and left eye image by utilizing

A transflective liquid crystal display panel of the present invention is used as the displaying liquid crystal panel 10 shown in Fig. 2, and combined with the patterned retardation plate 20 and the switching liquid crystal panel 30. In this way, a 2D/3D switching type liquid crystal display panel of the present invention is realized. In addition, by incorporating driving circuits, a backlight, or other components, the 2D/3D switching type liquid crystal display panel can realize a 2D/3D switching type liquid crystal display.

The invention being thus described, it will be obvious that the same way may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

INDUSTRIAL APPLICABILITY

According to a configuration of the present invention, linearity of display light is not hindered and desirable second display can be achieved. In addition, prevention of *moire* in first display (2D display) and desirable second display (3D display) can be realized at the same time. Therefore, the present invention can be suitably applied to

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a transflective liquid

effect of the parallax barrier means, so as to switch 2D display and 3D display,

said display image generating means being a transflective liquid crystal display panel including:

a reflective region for performing reflective display;
and

a transmissive region for performing transmissive display,

the reflective region and the transmissive region being provided for each pixel, and

a diffuser process being performed only in a portion corresponding to the reflective region.

11. (Added) A liquid crystal display panel, comprising:

display image generating means for generating two display images according to input image data;

parallax barrier means for separating the two display images into different viewing angles; and

switching means for activating and inactivating the effect of the parallax barrier means,

said display image generating means being a transflective liquid crystal display panel including:

a reflective region for performing reflective display;
and

a transmissive region for performing transmissive display,

the reflective region and the transmissive region being provided for each pixel, and

a diffuser process being performed only in a portion corresponding to the reflective region.

12. (Added) A liquid crystal display, comprising a liquid crystal display panel including:

display image generating means for generating two display images according to input image data;

parallax barrier means for separating the two display images into different viewing angles; and

switching means for activating and inactivating the effect of the parallax barrier means,

said display image generating means being a transflective liquid crystal display panel including:

a reflective region for performing reflective display; and

a transmissive region for performing transmissive display,

the reflective region and the transmissive region being provided for each pixel, and

a diffuser process being performed only in a portion corresponding to the reflective region.